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L6: Entry 7 of 11

File: USPT

May 28, 1996

US-PAT-NO: 5520916

DOCUMENT-IDENTIFIER: US 5520916 A

TITLE: Non-woven fabric material comprising hyaluronic acid derivatives

DATE-ISSUED: May 28, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dorigatti; Franco	Trento	N/A	N/A	ITX
Callegaro; Lanfranco	Padova	N/A	N/A	ITX
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US-CL-CURRENT: 424/402; 424/404, 424/444, 428/113, 442/405, 442/411, 602/45

CLAIMS:

What is claimed is:

1. A non-woven fabric material, comprised of fibers of at least one hyaluronic acid ester or at least one hyaluronic acid ester in combination with fibers of another polymer.
2. The non-woven fabric material of claim 1, wherein said polymer is a member selected from the group consisting of collagen, a coprecipitate of collagen and a glycosaminoglycan, cellulose, a polysaccharide in the form of a gel, a semisynthetic derivative of a polymer, a synthetic polymer, and mixtures thereof.
3. The non-woven fabric material of claim 2, wherein said polysaccharide in the form of a gel is a natural gum.
4. The non-woven fabric material of claim 2, wherein said polysaccharide in the form of a gel is a member selected from the group consisting of chitin, chitosan, pectin, pectic acid, agar, agarose, xanthan gum, gellan, alginic acid, an alginate, polymannan, a polyglycan, and a starch.
5. The non-woven fabric material of claim 2, wherein said semisynthetic derivative of a polymer is a member selected from the group consisting of chemically cross-linked collagen, a derivative of cellulose, a derivative of alginic acid, a derivative of a starch, a derivative of chitin, a derivative of chitosan, a derivative of gellan, a derivative of xanthan, a derivative of pectin, a derivative of pectic acid, a derivative of a polyglycan, a derivative of polymannan, a derivative of agar, a derivative of agarose, a derivative of a natural gum, and a derivative of a glycosaminoglycan.
6. The non-woven fabric material of claim 2, wherein said synthetic polymer is a member selected from the group consisting of polylactic acid, polyglycolic acid, a copolymer of polylactic acid and polyglycolic acid, a copolymer of a derivative of polylactic acid and a derivative of polyglycolic acid, a polydioxane, a polyphosphazene, a polysulfone resin, and a polyurethane resin.
7. The non-woven fabric material of claim 1, wherein said hyaluronic acid ester is present alone, or in combination with other hyaluronic acid esters.
8. The non-woven fabric material of claim 1, wherein said hyaluronic acid ester is the ethyl ester of hyaluronic acid.
9. The non-woven fabric material of claim 1, wherein said hyaluronic acid ester is the benzyl ester of hyaluronic acid.
10. The non-woven fabric material of claim 1, wherein said non-woven fabric material comprises a mixture of the ethyl ester of hyaluronic acid and the benzyl ester of hyaluronic acid.
11. The non-woven fabric material of claim 1, wherein said non-woven fabric material comprises a mixture of the benzyl ester of hyaluronic acid and a partial

benzyl ester of hyaluronic acid.

12. The non-woven fabric material of 11, wherein said partial benzyl ester of hyaluronic acid is a 75% benzyl ester.

13. The non-woven fabric material of claim 1, wherein said non-woven fabric material is impregnated with a pharmacologically active substance.

14. The non-woven fabric material of claim 13, wherein said pharmacologically active substance is an antibiotic.

15. The non-woven fabric material of claim 14, wherein said antibiotic is vancomycin.

16. The non-woven fabric material of claim 1, weighing between about 20 gr/mq and about 500 gr/mq, having a thickness between about 0.2 mm and about 5 mm, a diameter of the fibers between about 12 microns and about 60 microns, and a length of the fibers between about 5 mm and about 100 mm.

17. The non-woven fabric material of claim 1, weighing about 40 gr/mq, having a thickness of about 0.5 mm, a diameter of the fibers of about 20 microns, and a length of the fibers of about 40 mm.

18. The non-woven fabric material of claim 1, weighing about 200 gr/mq, having a thickness of about 1.5 mm, a diameter of the fibers of about 20 microns, and a length of the fibers of about 3 mm.

19. The non-woven fabric material of claim 1, wherein the residual humidity is between about 0.01 and about 10%.

20. The non-woven fabric material of claim 1, wherein said non-woven fabric material is subjected to chemical cohesive treatment, mechanical cohesive treatment, or treatment with a bonding agent.

21. The non-woven fabric material of claim 20, wherein said chemical cohesive treatment comprises soaking in a solvent, followed by coagulation.

22. The non-woven fabric material of claim 20, wherein said mechanical cohesive treatment comprises needle punching treatment.

23. A non-woven fabric material, comprised of fibers of at least one partial hyaluronic acid ester or at least one partial hyaluronic acid ester in combination with fibers of another polymer.

24. The non-woven fabric material of claim 23, wherein said partial hyaluronic acid ester is a partial benzyl ester of hyaluronic acid.

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File: USPT

Jan 30, 2001

US-PAT-NO: 6179872
DOCUMENT-IDENTIFIER: US 6179872 B1

TITLE: Biopolymer matt for use in tissue repair and reconstruction

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bell; Eugene	Boston	MA	N/A	N/A
Sioussat; Tracy M.	Reading	MA	N/A	N/A
Begley; Michael J.	Somerville	MA	N/A	N/A

US-CL-CURRENT: 623/11.11; 428/304.4, 442/123, 530/354, 530/356

CLAIMS:

What is claimed is:

1. A resorbable nonporous biopolymer matt comprising a densely packed random array of biopolymer fibrils.
2. The biopolymer matt of claim 1, wherein said biopolymer fibrils are selected from the group consisting of collagen, laminin, elastin, fibronectin, fibrinogen, thrombospondin, gelatin, polysaccharides, poly-l-amino acids and combinations thereof.
3. The biopolymer matt of claim 1, wherein said biopolymer fibrils are derived from collagen.
4. The biopolymer matt of claim 3, wherein said collagen is fetal porcine collagen.
5. The biopolymer matt of claim 1, wherein said biopolymer matt further comprises macromolecules necessary for cell growth, morphogenesis, differentiation, or tissue building and combinations thereof.
6. The biopolymer matt of claim 1, wherein the biopolymer fibrils are crosslinked.
7. The biopolymer matt of claim 1, further including a resorbable polymer selected from the group consisting of fibers, braids, bundles of fibers, fabrics and nonwoven fabrics.
8. The biopolymer matt of claim 1, wherein said biopolymer further includes pores.
9. The biopolymer matt of claim 1, wherein said matt is in or on a support.
10. The biopolymer matt of claim 9, wherein said support is porous.
11. The biopolymer matt of claim 10, wherein said biopolymer matt is bound to a single density biopolymer foam comprising a network of communicating microcompartments having biopolymer molecules and/or biopolymer filaments interspersed within the wall of the microcompartments, wherein the microcompartments: have volume dimensions of x, y, and z, wherein x=length, y=width, and z=height, are substantially equal, and range from about 1 .mu.m to about 300 .mu.m; and have an average wall thickness of less than about 10 .mu.m.
12. The biopolymer matt of claim 11, wherein said biopolymer foam is derived from fetal porcine collagen.
13. The biopolymer matt of claim 1, wherein said biopolymer matt further comprises cells.

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L6: Entry 4 of 11

File: USPT

Jan 5, 1999

US-PAT-NO: 5856245

DOCUMENT-IDENTIFIER: US 5856245 A

TITLE: Articles of barrier webs

DATE-ISSUED: January 5, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Caldwell; J. Michael	Cardiff	CA	N/A	N/A
Ellman; Peter	Olivenhain	CA	N/A	N/A

US-CL-CURRENT: 442/76; 128/849, 128/888, 424/404, 442/123, 442/152, 442/153,
442/164, 442/79, 602/48, 602/50, 604/372, 604/374, 604/377

CLAIMS:

What is claimed is:

1. An article comprising a web comprising a plurality of web members with interstices therebetween and an at least partially cured polymer composition derived from a shear-thinable thixotropic polymer, wherein the web is adapted to be, when polymer is in the fully cured state:
substantially impermeable to liquids;
permeable to selective gases; and
substantially impermeable to selective biological materials due to the presence in the cured polymer of one or more modifiers which interact with the biological materials.
2. The article of claim 1, wherein the web is flexible.
3. The article of claim 1, wherein the web is substantially rigid.
4. The article of claim 1, wherein the web is comprised of fibers.
5. The article of claim 1, wherein the web is woven.
6. The article of claim 1, wherein the web is non-woven.
7. The article of claim 1, wherein the web is comprised of a synthetic polymer.
8. The article of claim 7, wherein the synthetic polymer is selected from the group consisting of polyamides, polyesters, regenerated cellulose, cellulose acetate, and mixtures thereof.
9. The article of claim 1, wherein the web is comprised of natural fibers.
10. The article of claim 10, wherein the natural fibers are selected from the group consisting of cotton, linen, wool and silk.
11. The article of claim 4, wherein the fibers are comprised of a mixture of natural fibers and synthetic fibers.
12. The article of claim 11, wherein the fibers are comprised of a blend of cotton fibers and polyester fibers.
13. The article of claim 1, further comprising a substantially continuous internal layer.
14. The article of claim 1, wherein the article is a pad comprising at least one layer of the web and at least a second layer of an absorbent polymer.
15. The article of claim 1, wherein the article is a protective gown comprising at least one layer of the web.
16. The article of claim 1, wherein the article is a protective webbing material.
17. The article of claim 1, wherein the article is a wound dressing.
18. The article of claim 17, wherein the wound dressing comprises an outer layer of the web and an absorbent inner layer.
19. The article of claim 17, wherein the wound dressing has a growth factor selectively positioned on or within the surface of the web.

20. The article of claim 19, wherein the growth factor is selected from the group consisting of basic fibroblast growth factor (bFGF), acidic fibroblast growth factor (aFGF), nerve growth factor (NGF), epidermal growth factor (EGF), insulin-like growth factors 1 and 2, (IGF-1 and IGF-2), platelet derived growth factor (PDGF), tumor angiogenesis factor (TAF), pronectin, vascular endothelial growth factor (VEGF), corticotropin releasing factor (CRF), transforming growth factors .alpha. and .beta. (TGF-.alpha. and TGF-.beta.); interleukin-8 (IL-8), granulocyte-macrophage colony stimulating factor (GM-CSF); an interleukin, and an interferon.

21. The article of claim 17, further comprising a wound healing protein incorporated into the cured polymer.

22. The article of claim 21, wherein the wound healing protein is selected from the group consisting of collagen, cross-linked collagen, fibronectin, pronectin, laminin, elastin, and cross-linked elastin and heparin, heparin sulfate, heparinoids, dermatan sulfate, pentosan polysulfate, chondroitin sulfate, hyaluronic acid, cellulose, agarose, chitin, dextran, and carrageenin or combinations or biologically functional fragments thereof.

23. The article of claim 17, wherein the wound dressing has an antimicrobial agent selectively positioned in the cured polymer composition.

24. The article of claim 23, wherein the antimicrobial agent is selected from the group consisting of antibacterial agents, antiviral agents, antifungal agents and antiprotozoal agents.

25. The article of claim 24, wherein the antimicrobial agent is selected from the group consisting of isoniazid, ethambutol, pyrazinamide, streptomycin, clofazimine, rifabutin, fluoroquinolones, ofloxacin, sparfloxacin, rifampin, dapsone, tetracycline, doxycycline, erythromycin, ciprofloxacin, doxycycline, ampicillin, amphotericin B, ketoconazole, fluconazole, pyrimethamine, sulfadiazine, clindamycin, lincomycin, azithromycin, clarithromycin, pentamidine, atovaquone, paromomycin, diclazairil, acyclovir, trifluorouridine, foscarnet, and ganciclovir.

26. The article of claim 17, wherein the modifier has reactively available sites capable of binding an agent.

27. The article of claim 26, wherein the modifier is urethane.

28. The article of claim 27, wherein the agent is iodine.

29. The article of claim 28, wherein the iodine is reversibly bound to the urethane.

30. The article of claim 1, wherein the shear-thinable thixotropic polymer is selected from the group consisting of silicones, polyurethanes, fluorosilicones, modified polyurethane silicones, modified silicone polyurethanes, acrylics, and polytetrafluoroethylene, or combinations thereof.

31. The article of claim 1, wherein the web is selected from the group consisting of cotton, wool, silk, jute, linen, rayon, acetate polyesters, polyethyleneterephthalate, polyamides, nylon, acrylics, olefins, aramids, azlons, glasses, modacrylics, novoloids, nyltrils, rayons, sarans, spandex, vinal, vinyon, foams, films, foamed sheets, natural leathers, split hydes, synthetic leathers, vinyl, urethane, filtration membranes, polysulfones, polyimides, nitrocellulose, cellulose acetate, cellulose, and regenerated cellulose, or combinations thereof.

32. The article of claim 1, wherein the biological materials are microorganisms.

33. The article of claim 1, wherein the biological materials are cells.

34. The article of claim 33, wherein the microorganisms are selected from the group consisting of fungi, bacteria, viruses and protozoa.

35. The article of claim 1, wherein the modifier is an antimicrobial agent.

36. The article of claim 35, wherein the antimicrobial agent is selected from the group consisting of antibacterial agents, antiviral agents, antifungal agents and antiprotozoal agents.

37. The article of claim 35, wherein the antimicrobial agent is selected from the group consisting of isoniazid, ethambutol, pyrazinamide, streptomycin, clofazimine, rifabutin, fluoroquinolones, ofloxacin, sparfloxacin, rifampin, dapsone, tetracycline, doxycycline, erythromycin, ciprofloxacin, doxycycline, ampicillin, amphotericin B, ketoconazole, fluconazole, pyrimethamine, sulfadiazine, clindamycin, lincomycin, azithromycin, clarithromycin, pentamidine, atovaquone, paromomycin, diclazairil, acyclovir, trifluorouridine, foscarnet, and ganciclovir.

38. The article of claim 1, wherein the liquid is a bodily fluid.

39. The article of claim 38, wherein the bodily fluid is selected from the group consisting of saliva, gingival secretions, cerebrospinal fluid, gastrointestinal fluid, mucous, urogenital secretions, synovial fluid, blood, serum, plasma, urine, cystic fluid, lymph fluid, ascites, pleural effusion, interstitial fluid, intracellular fluid, ocular fluids, seminal fluid, mammary secretions, vitreal

fluid, and nasal secretions.

40. The article of claim 39, wherein the bodily fluid is urine.

41. The article of claim 39, wherein the bodily fluid is blood.

42. The article of claim 1, wherein the at least partially cured thixotropic polymer forms a thin film substantially encapsulating at least some of the web members leaving at least some of the interstices open.

43. The article of claim 1, wherein the web has one or more growth factors selectively positioned on a surface of the web.

44. The article of claim 43, wherein the growth factor is selected from the group consisting of basic fibroblast growth factor (bFGF), acidic fibroblast growth factor (aFGF), nerve growth factor (NGF), epidermal growth factor (EGF), insulin-like growth factors 1 and 2 (IGF-1 and IGF-2), platelet derived growth factor (PDGF), tumor angiogenesis factor (TAF), vascular endothelial growth factor (VEGF), corticotropin releasing factor (CRF), transforming growth factors α and β (TGF- α and TGF- β), interleukin-8 (IL-8); granulocyte-macrophage colony stimulating factor (GM-CSF); the interleukins, and an interferon.

45. The article of claim 1, wherein a wound healing protein is incorporated into the cured polymer.

46. The article of claim 45, wherein the wound healing protein is selected from the group consisting of collagen, cross-linked collagen, fibronectin, pronectin, laminin, elastin, cross-linked elastin hyaluronic acid, and combinations or biologically functional fragments thereof.

47. The article of claim 1, wherein the modifier has reactively available sites capable of binding an agent.

48. The article of claim 47, wherein the modifier is urethane.

49. The article of claim 48, wherein the agent is iodine.

50. The article of claim 49, wherein the iodine is reversibly bound to the urethane.

51. The article of claim 1, wherein the web is partially rigid.